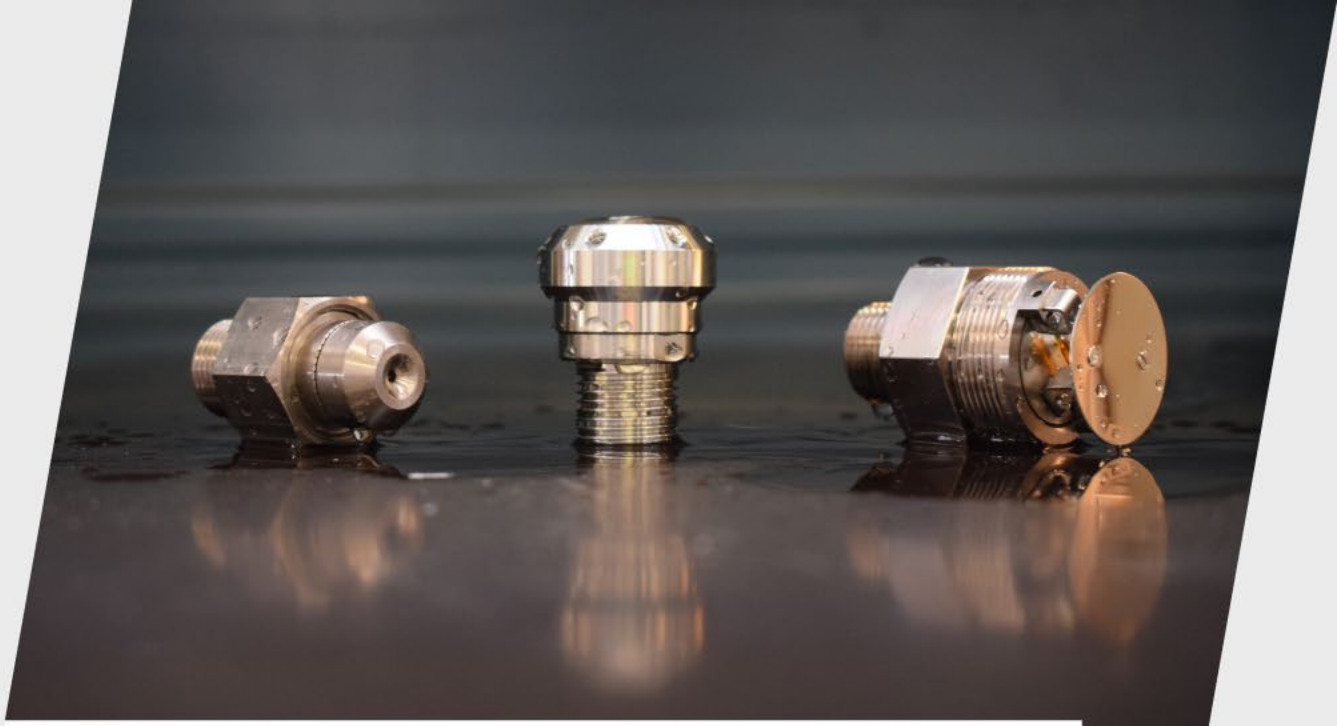
Water Mist Land Standards



Henrik Abrahamsen
R & D Manager

VID FIREKILL®
LOW PRESSURE WATERMIST

Date: 1-2 October 2025

Agenda

01 Protocol development

02 EN 14972-1:2020 current state and documents

03 Update on part 2-17

04 Annex A, how to use it

05 Component test according EN 17450

06 How to work with EN 14972-1:2020

Development of Protocols

VID FIREKILL®
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VdS

IBS Institut für Brandschutztechnik und Sicherheitsforschung

DFL
www.dafila.com

CEN
EUROPEAN COMMITTEE FOR STANDARDIZATION

FM Approvals®
Member of the FM Global Group

NFPA®

RI SE

efectis nederland
The European experts in fire safety

Organizations

- NFPA, National Fire Protection Association.
- Working through comities. Development of standards for installation and maintenance of fixed fire firefighting equipment.
- One can apply or being asked to participate in this work.
- NFPA 750 og 25 are guidelines for installation and maintenance of WM. NFPA 25 covers also sprinklers.


National Fire Protection Association

Certificate of Appointment

NFPA certifies that

Niels Henrik Abrahamsen

has been appointed to serve on the Committee on

Inspection, Testing, and Maintenance of Water-Based Systems

12/07/2018
Date of Issue

Chair, Standards Council

- CEN, European Committee for Standardization
- Development of European standards and work for voluntarily technical harmonization in Europe.

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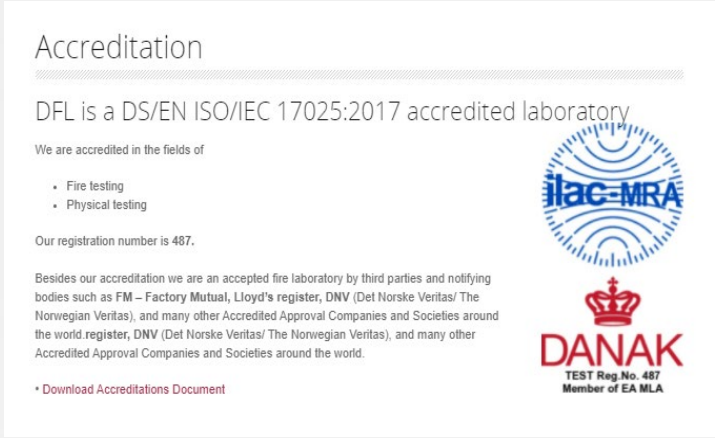
Organizations

They all have their own fire test protocols, aiming for specific applications.

- VdS have the 3883 part 1-8.
- FM have probably the most comprehensive standard in the WM world, FM 5560.
- IBS is well known in the German speaking countries and Middle East/UEA.
- Insurance parties approves systems which are tested accordingly the above-mentioned protocols.

Organizations

DFL
www.dafila.com



RI SE

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The European experts in fire safety

- These test facilities also have a great interest in this development work.
- All WM approvals are based on full scale application tests in regards of fire and components.

FM Approvals®
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- FM accepts a few European laboratories.

VdS

- VdS accepts all ISO 17025 accredited laboratories.

Manufacturers

VID FIREKILL®
LOW PRESSURE WATERMIST

Danfoss

MINIMAX

MARIOFF HI-FOG®
water mist fire protection

Johnson Controls
tyco

ULTRA FOG®
FIRE EXTINGUISHING SYSTEM

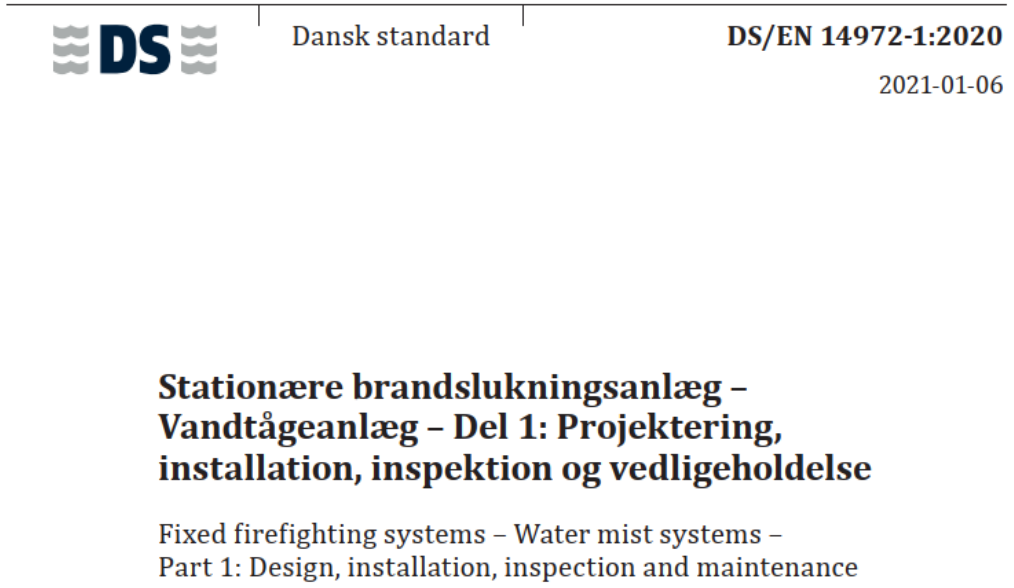
FOGTEC®
FIRE PROTECTION

- Manufacturers have a natural interest in participating in standard development.
- We know the industry, problems associated with the industry and lack of knowledge regarding WM in the standardization development.
- The benefit of having a mix of the participants in the industry is they can prevent favorization of one part of the industry i.e., HP versus LP.
- So therefore, Manufacturers can be considered as the experts adding valuable knowledge to the protocols.

EN14972-1:2020
The European water mist standard
Implementation date
30th June 2021
and prEN 14972-1/A1:2024 explanation

Current state of the EN 1972-1: 2020

- Scope: Document explains how to install WM systems and more, introducing the DIOM concept.
- Also emphasizes the connection between the EN14972-1 and the accepted fire test protocols, part 2-17, mentioned in this document.
- It also mention that certain specific national regulations apply and can take precedence over the document



DS Dansk standard DS/EN 14972-1:2020

2021-01-06

Stationære brandslukningsanlæg – Vandtågeanlæg – Del 1: Projektering, installation, inspektion og vedligeholdelse

Fixed firefighting systems – Water mist systems – Part 1: Design, installation, inspection and maintenance

Important Documents

The biggest difference in designing proces of the two technologies is the DIOM

TECHNOLOGY	MAIN STANDARD (THE GENERAL INFORMATION)	FIRE TEST PROTOCOLS	MANUFACTURE SUNIQUE INFORMATION	SYSTEM COMPONENT TEST PROTOCOLS
Watermist	EN14972 part 1	EN14972 part 2-17 (more parts will come in the future)	DIOM manual (design, installation, operation and maintenance manual)	EN17450 series
Sprinkler	EN12845		Datasheet or/and manual	EN12259 series

Unique DNA of each WM system. Scenario confirmed in test is described here.

Sprinkler parameters and construction is fixed. With standard you can design a system without knowledge who will produce nozzles

Understanding EN 14972 part 1

EN 14972:2020 part 1

1. Scope(1)
2. Normative reference(2)
3. Terms, definitions and abbreviations(3)
4. Design(5,6,7,8,9)
5. Installation(11)
6. Water mist system components(15,16,17,18)
7. Main pumps for water mist systems(10)
8. Testing, acceptance and commissioning(19,20,21)
9. Inspection and maintenance(19,20,21)
10. Documents(4)

DIOM (Design, Installation, Operation and Maintenance) manual based on data from fire tests to EN14972 part 2-17.

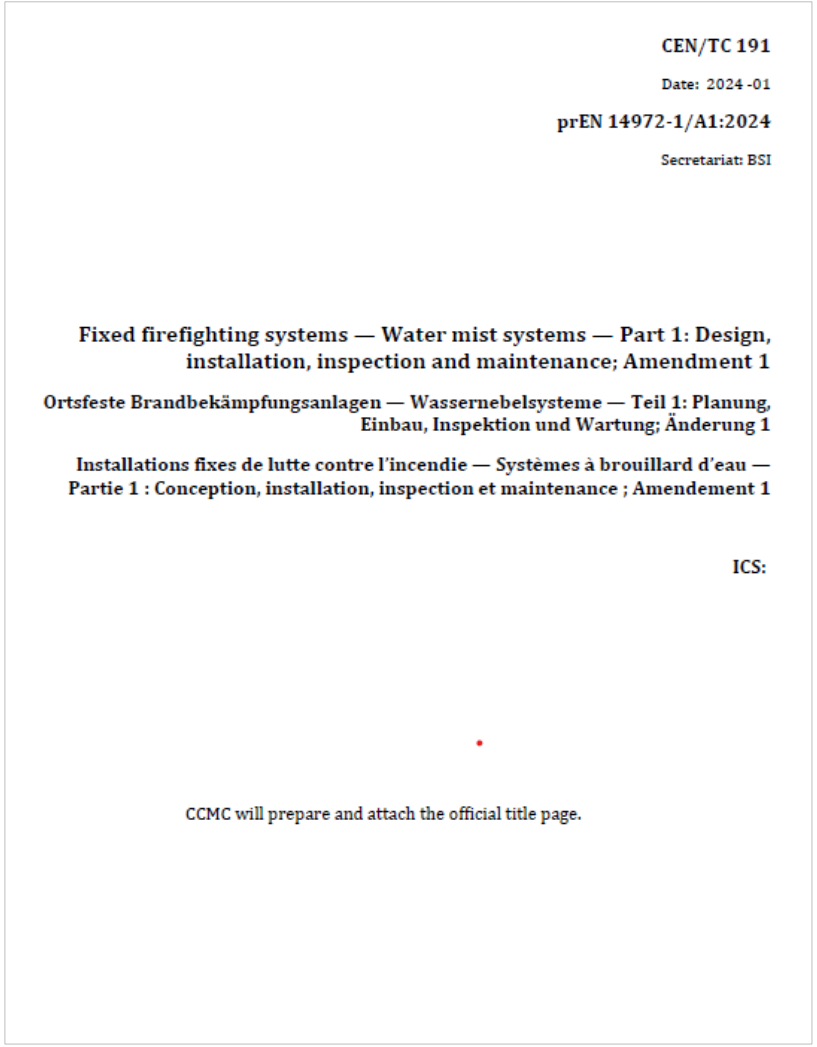
Numbers in brackets, number 1-10 in EN 14972:2020 part 1, refers to the stated numbers in EN 12845:2015+A1:2019

EN 12845:2015+A1:2019

1. Scope
2. Normative reference
3. Terms, definitions <<<<<<<and abbreviations
4. Contract planning and documentation
5. (D) Extend of sprinkler protection
6. (D) Classification of occupancies and fire hazards
7. (D) Hydraulic design criteria
8. (D) Water supplies
9. (D) Type of water supply
10. (D) Pumps
11. (I) Installation type and size
12. (I) Spacing and location of sprinklers
13. (I) Pipe sizing and layout
14. (I) Sprinkler design characteristics and uses
15. (O) Valves
16. (O) Alarm and alarm devices
17. (O) Pipework
18. (O) Signs, notices, and information
19. (M) Commissioning
20. (M) Maintenance
21. (M) Periodic system inspection

prEN 14972-1/A1: 2024 or amendment 1

- Scope: As focus in the fire test parts 2-17 is the test procedures and main application, its needed to clarify general boundaries and limitations.
- The aim is that prEN 14972-1/A1:2024 will fill the missing link.
- Also discussed in this amendment is modifications/clarifications for the EN 14972 -1.



CEN/TC 191

Date: 2024-01

prEN 14972-1/A1:2024

Secretariat: BSI

Fixed firefighting systems — Water mist systems — Part 1: Design, installation, inspection and maintenance; Amendment 1

Ortsfeste Brandbekämpfungsanlagen — Wassernebelsysteme — Teil 1: Planung, Einbau, Inspektion und Wartung; Änderung 1

Installations fixes de lutte contre l'incendie — Systèmes à brouillard d'eau — Partie 1 : Conception, installation, inspection et maintenance ; Amendement 1

ICS:

CCMC will prepare and attach the official title page.

Old

Table 1 — Design criteria

Occupancy [c]	Minimum design area [a]	Minimum nozzle quantity [a]	Fire test protocol [d]
Shopping storage areas [c] with a maximum storage area of 50 m² for any single block and not less than 2,4 m clearance around the block.	216 m²	-	
Cellular offices and open plan offices, areas with counters, restaurants and kitchens, public areas in buildings with low fire load or other corridors, churches, museums, hotel rooms, rooms in hospitals, nursing homes, senior citizens residences, flats, training classrooms, recreation areas. As well as further comparable risks.	72 m²	6	EN 14972-3[1]
Apartments, churches, concealed spaces (greater 800 mm in height), gymnasiums, hospitals, hotel rooms, libraries, museums, offices, restaurant seating areas, schools and university class rooms, unused attics.	140 m²	9	
Non-stacking garages, fully enclosed garages and underground garages for horizontal, solid, flat ceilings with heights of 2 m and above.	144 m² (wet system) 180 m² (dry system)	-	
Horizontal false ceilings and false floors between 300 mm and 800 mm.	72 m²	6	
Apartments, churches, concealed spaces, gymnasiums, hospitals, hotel rooms, libraries, museums, offices, restaurant seating areas, schools and university class rooms and unused attics.	72 m²	6	

[a] Values applicable for wet pipe water mist systems unless indicated.

[b] Some countries may have national annex with guidance on the maximum height and any additional requirements for apartment buildings higher than 18 m.

[c] The overlap in occupancies described in the table is due to more than one fire test protocol in EN 14972 series[1], covering the same occupancy. Refer to the DIOM manual for the minimum design criteria for the respective fire test protocol for the water mist system."

[d] The occupancies are intended to be covered by the fire test protocols (see European foreword). Where available are listed in coloumn and otherwise are in preperation.

New

Table 1 — Design criteria

Occupancy [c]	Minimum design area [a]	Minimum nozzle quantity [a]	Fire test protocol [d]
Sales areas, storage areas adjacent to sales areas, archives, libraries, technical areas/mechanical floors or similar.	216 m²	—	EN 14972-2
Cellular offices and open plan offices, areas with counters, restaurants and kitchens, public areas in buildings with low fire load, escape routes or other corridors, churches, museums, hotel rooms, rooms in hospitals, nursing homes, senior citizens residences, flats, training classrooms, recreation areas. As well as further comparable risks.	72 m²	6	EN 14972-3
Apartments, churches, concealed spaces (greater 800 mm in height), gymnasiums, hospitals and hospital laboratories, hotel rooms, libraries, museums, offices, meeting rooms, restaurant seating areas, kitchens, schools and university class rooms, unused attics, institutions.	140 m²	9	EN 14972-4
Non-stacking garages, fully enclosed garages and underground garages for horizontal, solid, flat ceilings with heights of 2 m and above.	144 m² (wet system) 180 m² (dry system)	—	EN 14972-5
Horizontal false ceilings and false floors between 300 mm and 800 mm.	72 m²	6	EN 14972-6
Apartments, churches, concealed spaces, gymnasiums, hospitals, hotel rooms, libraries, museums, offices, restaurant seating areas, schools and university class rooms and unused attics.	72 m²	6	EN 14972-7

prEN 14972-1/A1:2024 (amendment 1) examples

prEN 14972-1/A1:2024 (amendment 1) examples FM

1.2.3.5 Protection of machinery in enclosures with volumes exceeding 9175 ft^3 (260 m^3), Appendix E. This application includes enclosures with machinery such as internal combustion engines (excluding engine test cells), oil pumps, oil tanks, fuel filters, generators, transformer vaults, gear boxes, drive shafts, lubrication skids, diesel engine driven generators, and other similar equipment using liquid hydrocarbon fuel and/or hydraulic, heat transfer, and lubrication fluids with volatility less than or equal to heptane; enclosures with incidental use or storage of hydrocarbon ignitable liquids (also known as flammable liquids) of not more than two 55 gal (208 L) drums. All hazards included under the scope of this total compartment application shall be protected for a minimum of twice the longest time to extinguish the test fires, the time to shut down process equipment, or 10 minutes, whichever is greater.

1.2.3.6 Protection of gas turbines in enclosures with volumes exceeding 9175 ft^3 (260 m^3), Appendix F. Gas turbines included under the scope of this total compartment application shall be protected for a minimum of twice the longest time to extinguish the test fires, the turbine rundown time (including the time that the turbine surfaces are above the auto-ignition temperature of the lubricating fluid), the time to shut down process equipment, or 10 minutes, whichever is greater. For primary protection consideration, see Section 1.9, Definitions, “Primary Protection”.

prEN 14972-1/A1:2024 (amendment 1) examples

3.17 New Annex S for general tolerances

Add a new Annex S:

"

Annex S
(normative)

General tolerances

Unless otherwise stated, the following tolerances in Table S.1 apply.

Table S.1 — General tolerances

Variable	Tolerance
Angle	±2°
Frequency (Hz)	±5 %
Length	±5 %
Volume	±5 %
Rotation	±1 min^{-1}
Pressure	±5 %
Temperature	±5 %
Time	$^{+5}_{0}$s
	$^{+0,1}_{0}$min
	$^{+0,1}_{0}$h
	$^{+0,25}_{0}$d

New

The 2021 Update on EN 14972-1:2020 Part 2-17.

- Atriums
- Offices
- Conference rooms
- Reception and lobby areas
- Retail shops and kiosks
- Food and drink establishments
- Kitchens
- Hotel room and suites
- Corridors
- Clinics
- Storage rooms
- Server rooms
- Technical rooms
- Enclosed parking

The format of EN 14972-1:2020

EN 14972, *Fixed firefighting systems — Water mist systems* consists of the following parts:

— *Part 1: Design, installation, inspection and maintenance;*

— *Part 2: Test protocol for shopping areas for automatic nozzle systems;* → VdS

— *Part 3: Test protocol for office, school and hotel for automatic nozzle systems;* → VdS

— *Part 4: Test protocol for non-storage occupancies for automatic nozzle systems;* → FM Approvals (Member of the FM Global Group)

— *Part 5: Test protocol for car garages for automatic nozzle systems;* → VdS

— *Part 6: Test protocol for false floors and false ceilings for automatic nozzle systems;* → VdS

— *Part 7: Test protocol for commercial low hazard occupancies for automatic nozzle systems;* → LPCB

— *Part 8: Test protocol for machinery in enclosures exceeding 260 m³ for open nozzle systems;* → FM Approvals (Member of the FM Global Group)

— *Part 9: Test protocol for machinery in enclosures not exceeding 260 m³ for open nozzle systems;* → FM Approvals (Member of the FM Global Group)

— *Part 10: Test protocol for atrium protection with sidewall nozzles for open nozzle systems;* → DFL www.dafila.com

— *Part 11: Test protocol for cable tunnels for open nozzle systems;* → VdS

— *Part 12: Test protocol for commercial deep fat cooking fryers for open nozzle systems;* → ISO

— *Part 13: Test protocol for wet benches and other similar processing equipment for open nozzle systems;*

— *Part 14: Test protocol for combustion turbines in enclosures exceeding 260 m³ for open nozzle systems;*

— *Part 15: Test protocol for combustion turbines in enclosures not exceeding 260 m³ for open nozzle systems;* → FM Approvals (Member of the FM Global Group)

— *Part 16: Test protocol for industrial oil cookers for open nozzle systems;*

— *Part 17: Test protocol for residential occupancies for automatic nozzle systems.* → LPCB

CEN EUROPEAN COMMITTEE FOR STANDARDIZATION

The status of EN 14972-1:2020

Part Number	Document type	Scope	Status July 2025
EN 14972 part 1	Design, installation, inspection and maintenance	Buildings	Finished and implemented June. 2021
EN 14972 part 2	Fire test protocol	Shopping and sales areas	Formal vote soon
EN 14972 part 3	Fire test protocol	Office, school and hotel	Finished and implemented Aug. 2021
EN 14972 part 4	Fire test protocol	Non storage occupancies	Finished and implemented April 2024
EN 14972 part 5	Fire test protocol	Car garage	Finished and implemented October 2024
EN 14972 part 6	Fire test protocol	False floor and ceiling	Finished and implemented May. 2023
EN 14972 part 7	Fire test protocol	Commercial low hazard occupancies	Finished and implemented August. 2023
EN 14972 part 8	Fire test protocol	Machinery enclosures >260m³	Finished and implemented Jan. 2020
EN 14972 part 9	Fire test protocol	Machinery enclosures <260m³	Finished and implemented Jan. 2020
EN 14972 part 10	Fire test protocol	Atrium	Finished and implemented April. 2022
EN 14972 part 11	Fire test protocol	Cable tunnels	Finished and implemented May. 2023
EN 14972 part 12	Fire test protocol	Commercial deep fat fryers	Finished and implemented July. 2024
EN 14972 part 13	Fire test protocoL	Wet benches and similar processing equipment	Formal vote soon
EN 14972 part 14	Fire test protocol	Combustion turbine enclosures >260m³	Finished and implemented Sep. 2021
EN 14972 part 15	Fire test protocol	Combustion turbine enclosures <260m³	Finished and implemented Sep. 2021
EN 14972 part 16	Fire test protocol	Industrial Oil cookers	Finished and implemented Aug. 2019
EN 14972 part 17	Fire test protocol	Residential and domestic occupancies	Finished and implemented July. 2025
EN 14972 part 18	Fire test protocol	Local application, flammable liquids	Work group created
EN 14972 part 19	Fire test protocol	Areas with combustible flammable liquids	Work group created
EN 14972 part 20	Fire test protocol	HC2 and HC3	Work group created, on hold
EN 14972 part 21	Fire test protocol	Data processing areas	Work group created
EN 14972 part 22	Fire test protocol	Electronically activated nozzles, Domestic use	Work group created

Note: the list of ”parts” has been evolveing with new protocols and in case of a missing part, the risk can be covered by EN14972-1:2020 Annex A

The status of EN 14972-1:2020

EN 17450 SERIES	Document type	Scope	Status July 2025
EN 17450 part 1	Component test protocol	Strainer and wire mesh	Finished and implemented Feb. 2021
EN 17450 part 2	Component test protocol	Nozzles	Finished and implemented Oct. 2024
EN 17450 part 3	Component test protocol	Check valves	Finished and implemented April. 2025
EN 17450 series	Component test protocol	Control deluge valves and actuator	Work group created
EN 17450 series	Component test protocol	Pressure switches	Work group created

Note: the list of ”parts” has been evolveing with new protocols and in case of a missing part, the risk can be covered by EN14972-1:2020 Annex A

Part 2

Test protocol for Protection of Shopping and Storage spaces. This part will be based on a VdS protocol.

- Scope: Shopping and Storage.
- Storage types like what one know from sprinklers.
- Approval based on performance of sprinkler versus WM. Meaning sprinkler tests are always mandatory.
- OH-3 sales, storage and technology areas enclosed by OH-1 areas.

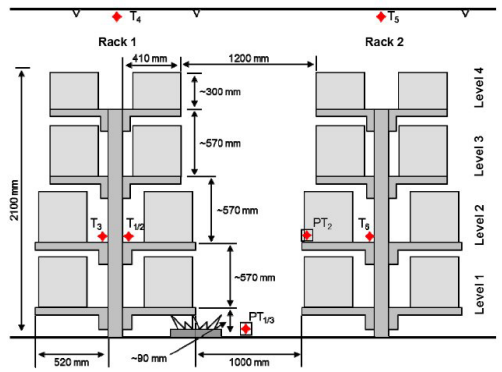
Protection of selected OH-3 sales, storage and technology areas enclosed by OH-1 areas.
The area in question shall be enclosed by enclosure surfaces made of non-combustible materials (no fire protection classification). Outside of the solid walls a row of sprinklers shall be installed which have the same parameterisation / design as those inside the area.
The additional sprinkler row outside the area will not be required, if the walls are fire-resistant (F 90), exterior walls of the building, or contain other protected areas than those specified above.

Restrictions and limitations:

- Sale of furniture with foamed plastics alone is not allowed
- A special proof is necessary for extensive open areas (e.g. malls)
- No computer rooms / IT rooms
- No storage of flammable liquids, gases etc.
- Room protection only (no content or local application protection)
- Permitted storage height depends on type of storage: Cat. I = 3,00 m, Cat. II = 2,60 m, Cat. III = 1,70 m and Cat. IV = 1,20 m
- Chaotic storage of materials with exposed plastic surfaces amounting to > 25% without cardboard is permitted up to 5% of the total storage or capacity

Storage types ST1 - ST4:
Maximum dimensions of areas: 120 m² (design of area of operation for these areas: area size plus 50%, however 180 m² max.)

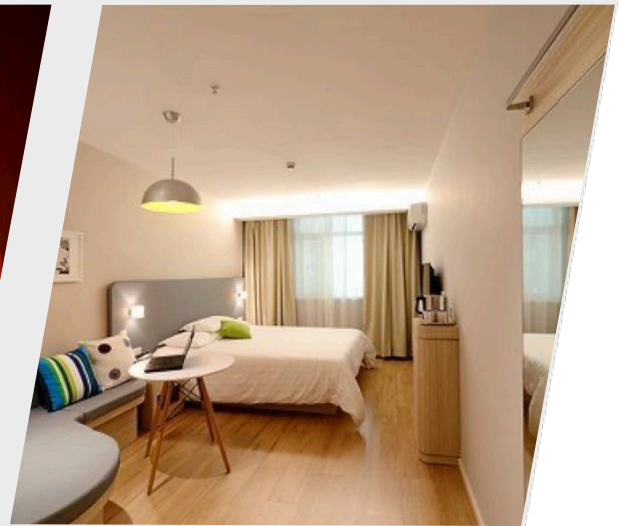
Storage types ST5 - ST6:
Design of area of operation for these areas 216 m² (in accordance with VdS CEA 4001)



Part 3

Test protocol for Protection of office and accommodation spaces. This will be based on a VdS protocol.

- Scope: Office and accommodation areas.
- Requires two different test set- ups.
- Approval based on performance of sprinkler versus WM.
- Covers a wide range of applications.



Accommodation areas:

The following areas are considered to be covered by the accommodation areas fuel package in accordance with clause 5.3:

- hotel rooms
- rooms in hospitals, nursing homes, senior citizens residences
- flats
- recreation areas

Office spaces: The following areas are considered to be covered by the office and school fuel package in accordance with clause 5.2:

- cellular offices and open plan offices
- areas with counters
- restaurants and kitchens
- rooms for data processing

  Note: In case the rooms for data processing are protected by means of water mist sprinkler systems under the ceiling, these cannot be assumed to fight fires inside of server cabinets or the like.
- public areas in buildings of low fire load
- escape routes or other corridors
- training classrooms
- churches
- museums

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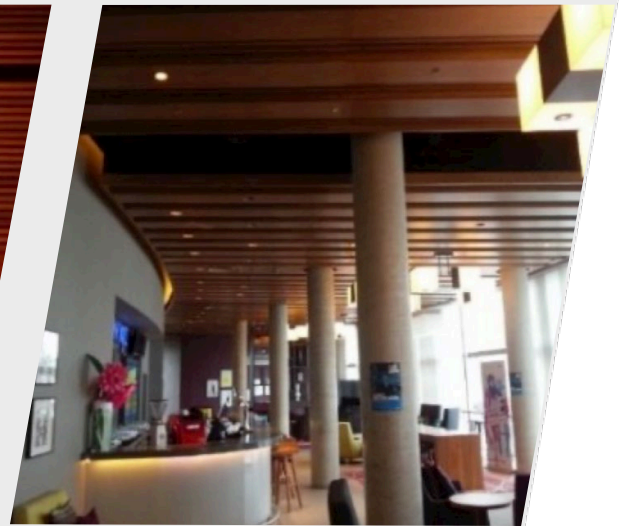
Part 4

Test protocol for Protection of HC1 areas. This will be based on the FM protocol 5560, Appendix G, Non-Storage Occupancies for Automatic Nozzle Systems

- Scope: Office and accommodation areas.
- Requires 3 different test set-ups.
- Approval based on predefined requirements such as temperature and damage control.
- Covers a wide range of applications.
- Testing according part 4 and part 7 are very similar



FM Global
Property Loss Prevention Data Sheets **3-26**

Table 4. Nonstorage, Non-Manufacturing Occupancies and their Associated Fire Hazard Categories (cont'd)

Occupancy	*Description*	*Hazard Category*	*Considerations*
Leisure Facilities & Public Assembly	- Museums and Monuments - Restaurants (Seating Areas) - Gyms - Places of Worship - Ski Lift Station - Zoo / Aquarium - Auditoriums - Aquatic Center (Swimming Pool/ Spa) - Theatres - Cinemas - Convention Centers - Theme Parks - Libraries	HC-1	- Theaters, auditoriums, and casinos may sometimes qualify as HC-1 occupancies when ordinary combustibles loading is minimal, or the construction of the building is noncombustible. For example, casino areas with ceilings under 30 ft (9 m) high and only lined with slot machines would qualify as HC-1. Auditoriums or theaters, including staging practically empty of ordinary combustibles, would also qualify. Consider backstage and below stage areas without storage to be HC-2. - Large convention centers have the potential to display products that have high amounts of plastic and/or have concealed spaces.
	- Sport Arena - Theaters - Casinos - Night Clubs	HC-2	
	- Exhibition Halls - Theatre: Backstage and Below Stage Areas. - Convention Centers	HC-3	

1. Restricted Approval
   A water mist system shall successfully complete fire tests G.4.1 and G.4.2 for Approval in restricted areas. Restricted Approval may apply to water mist systems using upright, pendent, or sidewall nozzles, including flush, recessed, and concealed pendent and sidewall nozzles.
2. Unrestricted Approval
   A water mist system evaluated for unrestricted areas shall successfully complete all five fire performance tests, G.4.1 through G.4.5. Unrestricted Approval may apply to water mist systems using upright or pendent nozzles, including flush, recessed, and concealed pendent nozzles. Unrestricted Approval is not permitted for water mist systems using sidewall nozzles.

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Part 5

Test protocol for Car garages. This will be based on a VdS protocol.

- Scope: Car garages.
- Requires use of real cars.
- Approval based on performance of sprinkler versus WM. Meaning sprinkler tests are always mandatory.
- Automatic car stackers etc. is not covered.

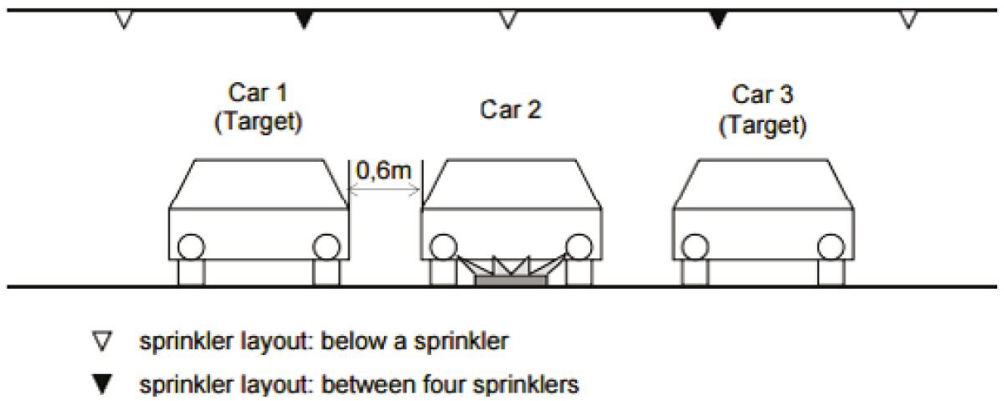

Figure 4-1: Assembly of fire loads and position of ignition source

These tests are carried out to evaluate the extinguishing effectiveness of water mist systems for the protection against OH2 risks for the application car park garages in the context of the approval and testing procedure in accordance with VdS 2562.

In the tests specified in this concept the water mist system to be approved shall have at least equal extinguishing effectiveness as a sprinkler system.

These tests can only be applied for the evaluation of the extinguishing effectiveness of water mist systems for the application OH2 car park garages. It is not possible to apply them to other OH2 risks or higher room heights.

In case of a positive result of the tests the water mist system to be approved can be approved for the protection against the following OH2 risks:

Protection of non-automatic, fully enclosed garages and underground garages.

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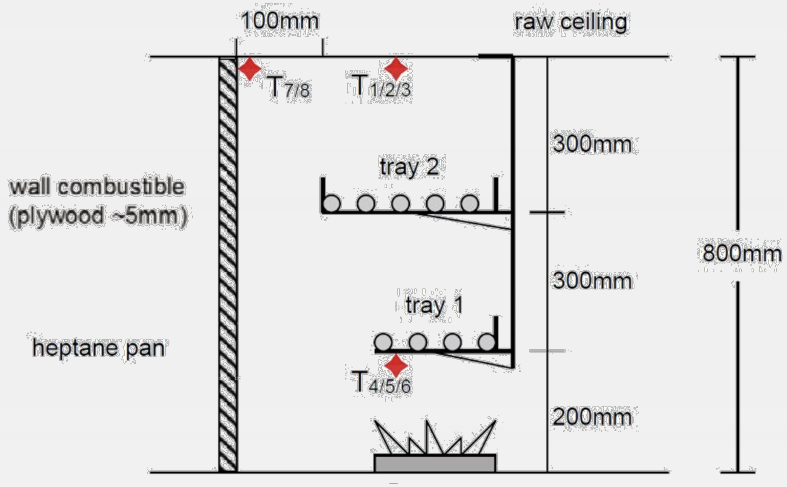
Part 6

Test protocol for Car garages. This will be based on a VdS protocol.

- Scope: False ceilings and floors.
- Requires Only one test set-up.
- Approval based on performance of sprinkler versus WM. Meaning sprinkler tests are always mandatory.
- Covers false ceilings between 300 and 800mmin OH-1.



False ceilings and false floors between 300 mm and 800 mm
(Raw ceiling/false floor including supports non-combustible, cables with density < 40% of the footprint and fire load > 12,6 MJ/m²)

The test scenario is based on a typical false ceiling comprising the appropriate fire load in terms of cabling.

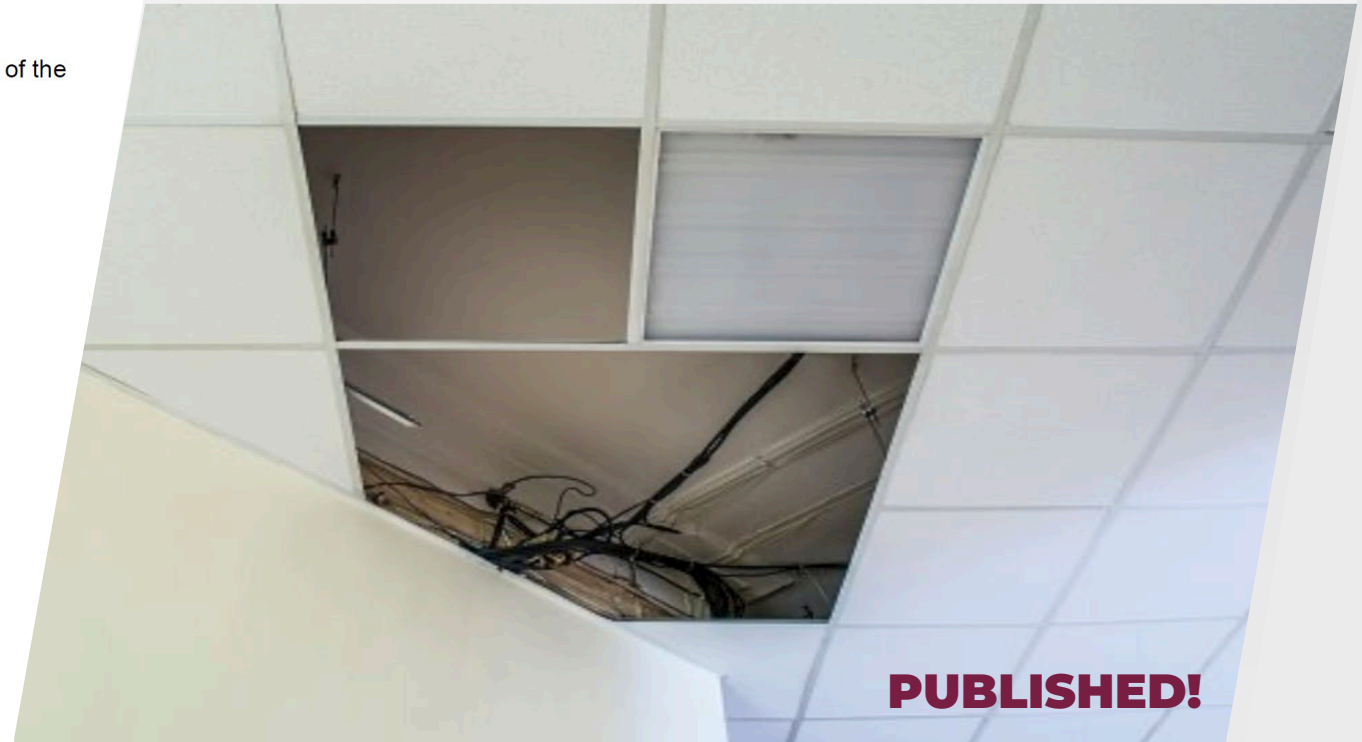
The test assembly shall include the following elements:

a) housing
b) cable trays
c) cables as fire load
d) heptan pan as ignition source

Tests:

The test assembly simulates a false floor / false ceiling in the test scale. The following scenarios are tested in different test procedures:

- Test 1: Free-burn test, fire without extinguishment
- Test 2: Ignition between 2 sprinklers as reference test (Spr1)
- Test 3: Ignition between 2 nozzles (Fein1)
- Test 4: Ignition between 2 nozzles (Fein2), confirmatory test



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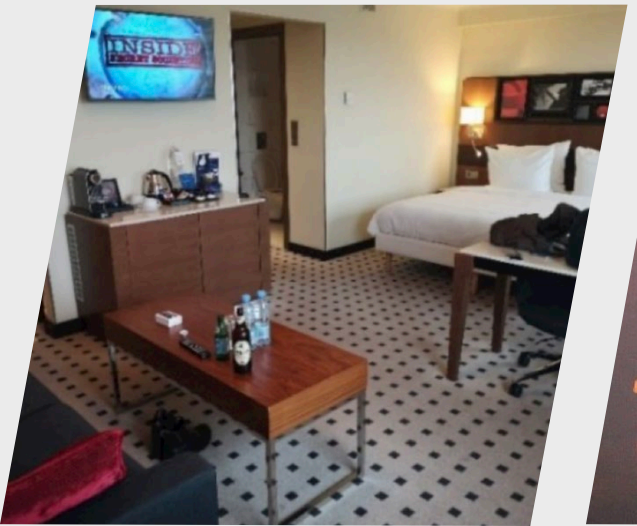
Part 7

Protection of low hazard occupancies. This will be based on a BS standard.

- Scope: Low hazard occupancies.
- Requires 3 different test set-up.
- Approval based on predefined requirements such as temperature and damage control.
- Covers a wide range of applications.
- Testing according part 4 and part 7 are very similar.



This part of BS 8489 describes tests and specifies requirements for industrial and commercial watermist systems for the protection of low hazard occupancies as defined in BS 8489-1.

This part of BS 8489 is applicable to ceiling heights up to 5 m.

category I system
system that covers rooms up to and including 37 m^2 containing low hazard fire loads

category II system
system that covers rooms above 37 m^2 containing low hazard fire loads

category III system
system that covers rooms containing low hazard fire loads

low hazard occupancy
non-storage, non-manufacturing occupancy where the quantity and/or combustibility of the content is low and fires with relatively low rates of heat release are expected, with maximum fuel loads and obstructions as indicated in **4.7** to **4.10**

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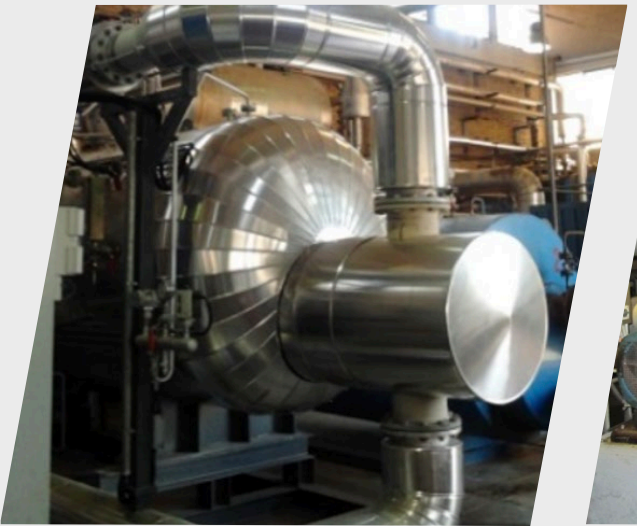
Part 8

Protection of Machinery space. This protocol is based on the FM Test Protocol, Appendix E, volumes exceeding 260 m³.

- Scope: Machinery spaces exceeding 260m³.
- Requires 1 test set-up, different fires.
- Approval based on predefined requirements such as temperature and extinguishment.
- Covers Machinery spaces within the tested volume and limited ventilation.



Protection of machinery in enclosures with volumes exceeding 9175 ft^3 (260 m^3), Appendix E. This application includes enclosures with machinery such as internal combustion engines (excluding engine test cells), oil pumps, oil tanks, fuel filters, generators, transformer vaults, gear boxes, drive shafts, lubrication skids, diesel engine driven generators (reference FM Global Datasheet 5-23), and other similar equipment using liquid hydrocarbon fuel and/or hydraulic, heat transfer, and lubrication fluids with volatility less than or equal to heptane; enclosures with incidental use or storage of hydrocarbon ignitable liquids (also known as flammable liquids) of not more than two 55 gal (208 L) drums. All hazards included under the scope of this total compartment application shall be protected for a minimum of twice the longest time to extinguish the test fires, the time to shut down process equipment, or 10 minutes, whichever is greater. For primary protection consideration, see Section 1.9, Definitions, "Primary Protection", and consult the FM Global Property Loss Prevention Data Sheet for the recommended protection of the specific hazard in the applicable occupancy.

Internal Combustion Engines
Oil pumps
Fuel filters
Generators
Transformer vaults
Gear boxes
Drive shafts
Lubricated skids
Diesel engine driven generators
Combustion turbines

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Part 9

Protection of Machinery space. This protocol is based on the FM Test Protocol 5560, Appendix C. Fire tests for water mist systems for the protection of machinery in enclosures with volumes not exceeding 260 m³.

- Scope: Machinery spaces not exceeding 260m³.
- Requires 1 test set-up, different fires.
- Approval based on predefined requirements such as temperature and extinguishment.
- Covers Machinery spaces within the tested volume and limited ventilation.
- Is a good basis for Stand alone systems.

Protection of machinery in enclosures with volumes not exceeding 9175 ft^3 (260 m^3), Appendix C. This application includes rooms with machinery such as internal combustion engines (excluding engine test cells), oil pumps, oil tanks, fuel filters, generators (reference FM Global Datasheet 5-23), transformer vaults, gear boxes, drive shafts, lubrication skids, diesel engine driven generators, and other similar machinery using fuel and/or lubrication fluids with volatilities less than or equal to heptane. All hazards included under the scope of this total compartment application shall be protected for a minimum of twice the longest time to extinguish the test fires, the time to shut down process equipment, or 10 minutes, whichever is greater.

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Part 10

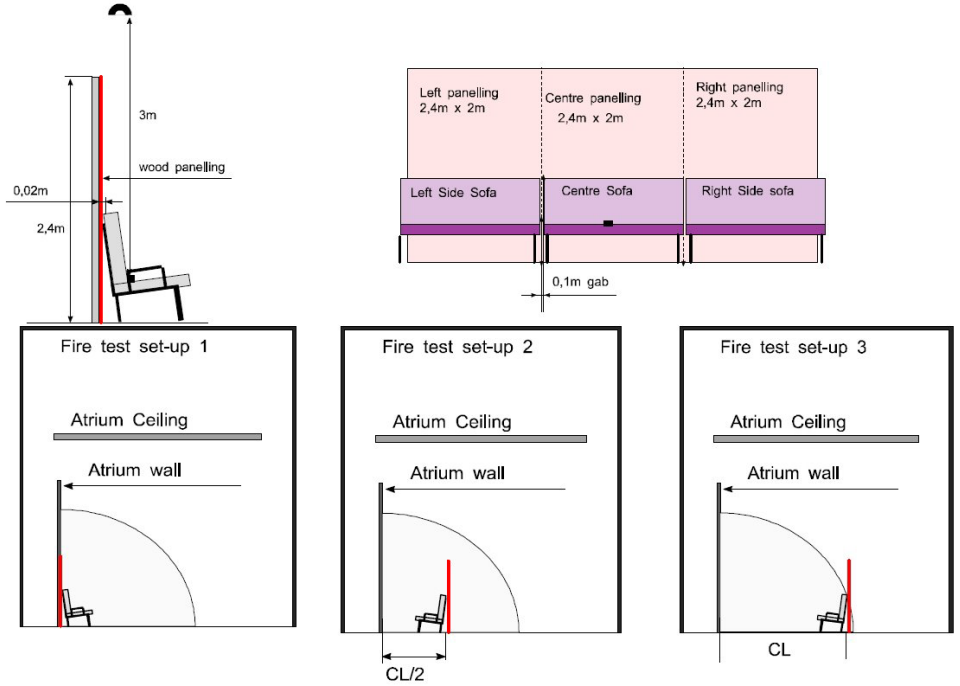
Protection of Atriums. This will be based on the Danish Fire Laboratories Fire Test Method: DFL TM 70111-04.

- Scope: Atriums, areas with high ceiling heights, horizontal protection.
- Requires 1 test set-up.
- Approval based on predefined requirements such as damage.
- Covers atriums of unlimited height and areas as tested in regards of max. coverage from walls.

Scope:
The scope of DFL Method 70111-04 is to test the fire suppression performance of systems for fire protection of atriums.

The method coves water based fire protection systems, which are characterized by spraying a water based fire suppression agent from atrium walls into to the atrium volume.
Examples of such systems are: Sprinkler systems with open or closed sprinkler nozzles, and water mist systems with open or closed nozzles.

The test method are suitable for absolute testing of the fire suppression systems, without comparison to other systems, as well as for comparison of fire control and fire suppression capabilities of different fire protection systems.



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Part 11

Test protocol for Cable tunnels. This will be based on a VdS protocol. Protection of Cable ducts.

- Scope: Cable tunnels/ducts.
- Requires 1 test set-up.
- Approval based on predefined requirements such as damage to cables and temperatures measurements.
- Covers cable tunnels/ducts with dimensions and wind velocities as tested.

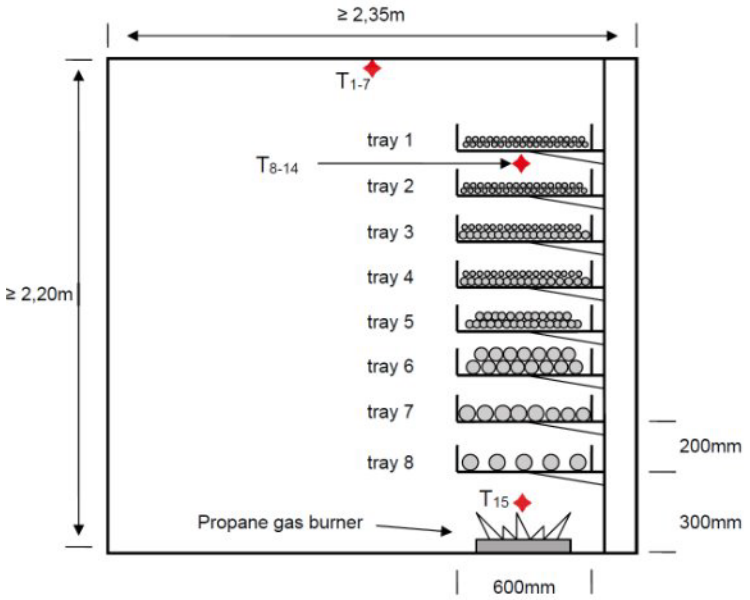
Any fire loss at the test assembly shall be quantified. The following issues shall be taken into account in the evaluation:

1. Determination of the fire loss:
   - damaged cables on each cable tray
2. Determination of the temperature sequences:

   The temperature curves measured during the test shall be averaged over 30 s (maximum interval between measurements 1 s).

   The tests have been passed, when the following applies:

   - The temperatures in the fire test room shall be decreased below 100°C within 5 minutes of the activation of the extinguishing system.
   - Not later than 15 minutes after activation of the extinguishing system no flames or embers shall be visible at any of the cables. This is checked visually and by means of a thermographic camera[1].
   - After finishing the test, the cables of each cable tray shall not be damaged over a length of 1 m each on both sides of the cable tray.



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Part 12

Test protocol for Commercial deep fat cooking fryers. This will be based on the ISO 15371 Ships and marine technology-Fire extinguishing systems for protection of galley deep-fat cooking equipment.

- Scope: commercial deep fat cooking fryers.
- Requires 1 test set-up with several different tests.
- Approval based on predefined requirements such as duration of the fire ball, extinguishment and cooling of the fat.
- Covers commercial deep fat fryers with the same amount of fat as tested.

3.2.7 The liquid grease in the fryer shall be heated by its heating source until auto-ignition occurs. If the grease temperature reaches 363 °C and the grease still has not ignited, it shall be ignited manually. The fire shall burn freely with the fryer's heating source remaining on for a period of not less than one minute. After the free-burn period, the heating source shall be shut off and the extinguishing system unit shall be manually discharged.

1 Scope

This International Standard applies to the design, testing, and operation of pre-engineered fire extinguishing systems to protect the galley hoods, ducts, fryers and other grease-laden appliances.

Pre-engineered fire-extinguishing system units are also required to comply with requirements for the construction and components performance as applicable to specific types, designs, sizes and arrangements. This International Standard also provides minimum requirements for the testing and evaluation of components.

A product that contains features, characteristics, components, materials or systems that are new or different from those covered by the requirements in this International Standard and that involve a risk of fire, electric shock, or injury to persons, shall be evaluated using the appropriate additional component and end-product testing.

NOTE Only deep-fat cooking equipment, among the types of galley cooking equipment covered by this International Standard, are required by SOLAS chapter II-2 Regulation 10.6.4 to have fixed fire-extinguishing systems.

5.1.1.2 When tested with a cooking appliance, the extinguishing system unit shall:

a) result in the flame in the appliance being completely extinguished in one minute or less;

b) within 10 seconds of the release of the system, not cause a fire ball over the appliance that is larger than the initial fire;

c) for deep fat fryers, woks and ranges, not permit reigniting of the grease for 20 minutes or until the temperature of the grease decreases at least 33,3 °C below its observed auto-ignition temperature, whichever is longer; and

d) for all appliances other than deep fat fryers, woks and ranges, not permit re-ignition of the grease for five minutes.

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Part 13

Test protocol for Wet Benches and Similar. This will be based on the FM 5560, Appendix H. Fire test for Wet benches and other similar processing equipment for open nozzle systems.

- Scope: Wet benches and similar.
- Requires 1 test set-up with several different tests like ventilated/unventilated, different pool and splash tests.
- Approval based on extinguishment within 60 sec from release of WM system
- Covers Wet benches and similar equipment.

H.4 VENTILATED SUBSURFACE (PLENUM) FIRE TESTS (SEE FIGURES H-7 AND H-8)

H.4.1 Nominal 4 in. (102 mm) Diameter Polypropylene Pool Fire

Criterion:	Fire extinguishment in 60 seconds or less (timed from system activation)
Fuel:	The polypropylene fuel shall consist of polypropylene beads, approximately 0.08 to 0.12 in. (2 to 3 mm) in diameter, filled to a depth of 0.75 in. (19 mm) in a 4 in. (102 mm) diameter dish. Three 0.5 by 2 in. (13 by 51 mm) polypropylene coupons shall be placed on top of the beads (see Figure H-10).
Fire Location:	The solid polypropylene fuel shall be placed within the subsurface space at a location chosen by FM Approvals.
Fire Preburn Time:	Minimum 30 seconds
Test Procedure:	The fuel shall be ignited using a 12 V, 9 A glow plug. Ignition will typically occur within 15 to 30 seconds, but the glow plug should remain on for a period of time to ensure ignition of the fuel. The burning shall be allowed to reach a steady state condition. An initial slow fire growth period (20 to 30 minutes) will occur, followed by rapid growth and the development of a steady state fire within a period of approximately 3 minutes. Once steady state burning is achieved, the preburn time shall begin, and the water mist system should be manually activated subsequent to the required preburn time.

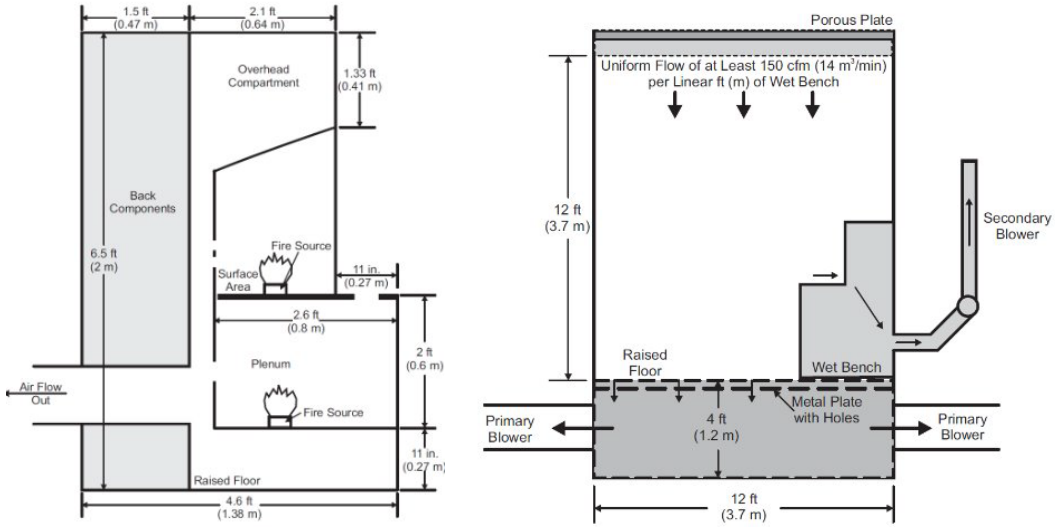

Table H.4.6 Ignitable Liquid (also Known as Flammable Liquid) Pool Fuel Properties

Formula	*Flash Point - Closed Cup*		*Flash Point - Open Cup*		*Burning Rate Nominal 6 in. (150 mm) Diameter Pool Fire*	
	°F	*(°C)*	*°F*	*(°C)*	*kW*	*(BTU/sec)*
Acetone (CH3)CO	0	(-17.8)	15	(-9.4)	18	(17.1)
Isopropyl Alcohol (IPA) (CH3)2CHOH	53	(11.7)	60	(15.6)	12	(11.4)
Heptane CH3(CH2)5CH3	25	(-3.9)	30	(-1.1)	58	(55.0)

G. General dish specifications:

The dishes shall be standard polystyrene, circular Petri dishes, with diameters of 4 in. (102), 6 in. (152 mm), 8 in. (203 mm), 10 in. (254 mm), and 12 in. (305 mm), and a height equal to 1 in. (25 mm). For the polypropylene fuel fires, the polypropylene beads shall be filled to a depth of 0.75 in. (19 mm), and the polypropylene coupons shall be placed on top of the beads. For the ignitable liquid (also known as flammable liquid) fuel fires, the fuel shall be filled to a depth of 0.75 in. (19 mm).

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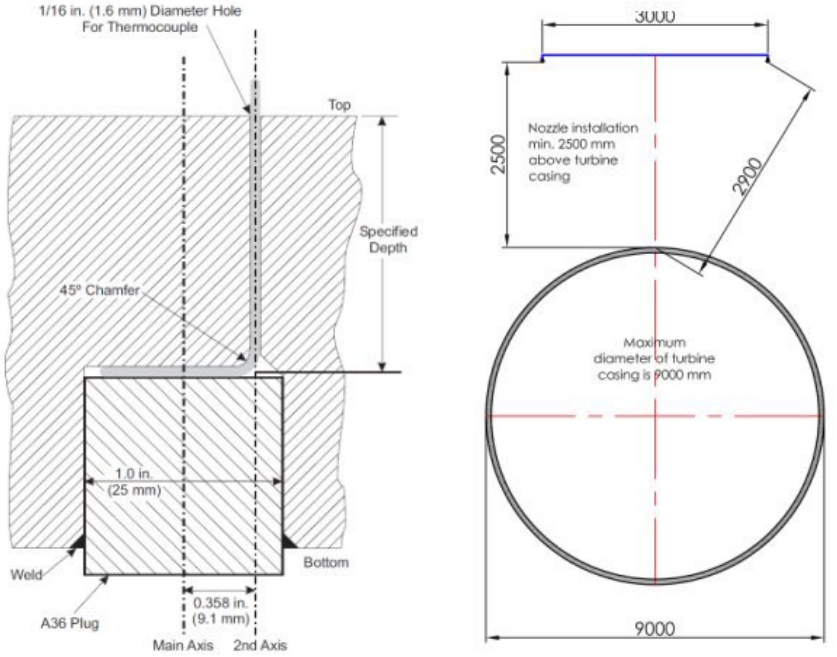
Part 14

Protection of gas turbines. This will be based on the FM Test Protocol 5560, Appendix F. Fire tests for water mist systems for the protection of gas turbines in enclosures with volumes exceeding 260 m³.

- Scope: Gas turbines in enclosures exceeding 260m³.
- Requires 2 test set-up with insulation material involved + a cooling test.
- Approval based on extinguishment and suppression of the fires. Standoff distance found through the cooling test.
- Covers insulated and uninsulated gas turbines.



To determine the cooling rate of the combustion turbine steel plate mockup, caused by the discharge of the water mist system, three thermocouples should each be embedded near the center of the plate at approximately 0.5 in., 1.0 in., and 1.50 in. (12 mm, 25 mm, and 38 mm) below the plate's top surface. The three inconel-sheathed thermocouples should be embedded in the plate by removing cylindrical plugs from the plate.

The thermocouples should be inserted to allow the thermocouple wire to follow a horizontal path of sixteen thermocouple diameters in length, thus reducing errors due to the vertical temperature gradient in the plate. A heat conductive and electrically insulating sealant should be applied, and the steel cylindrical plugs should be replaced and welded to the plate around the top periphery of the plugs. This can be accomplished by using a 1.0 in. (25 mm) diameter miller tool, installing the thermocouples, and then refilling the hole welded 1.0 in. (25 mm) round bar stock (see Figure F-6).

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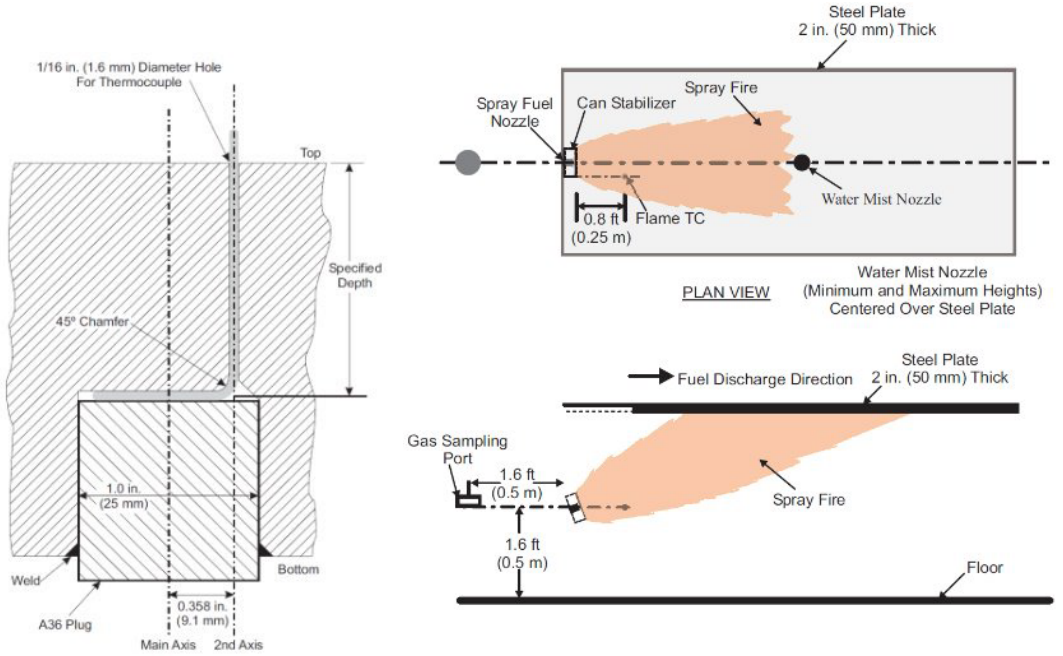
Part 15

Protection of gas turbines. This will be based on the FM Test Protocol 5560, Appendix D. Fire tests for water mist systems for the protection of machinery in enclosures with volumes not exceeding 260 m³.

- Scope: Gas turbines in enclosures not exceeding 260m³.
- Requires 2 test set-up with insulation material involved + a cooling test.
- Approval based on extinguishment and suppression of the fires. Standoff distance found through the cooling test.
- Covers insulated and uninsulated gas turbines.

various steel table and sheet metal surfaces to permit water run-off. For ease of conducting the spray cooling test, it is recommended to either butt up or simply attach the table and sheet metal extension surfaces with screw fasteners.

The space below the plate is partially shielded from water mist using 3.3 ft high by 1.6 ft wide (1 m by 0.5 m) sheet metal baffles. The side baffles should be of 22 gauge (0.85 mm thick) galvanized sheet metal construction and removable. They may be installed on support legs and kept in place by being pinched between the underside of the steel plate table and the 45 degree angle extensions and the floor for ease of removal. Placement of additional baffles or obstructions may be needed to prevent the direct impact of mist on the pool or spray test fires, at the sole discretion of FM Approvals.



To determine the cooling rate of the combustion turbine steel plate mockup, caused by the discharge of the water mist system, three thermocouples should each be embedded near the center of the plate at approximately, 0.5 in., 1.0 in, and 1.50 in. (12 mm, 25 mm, and 38 mm) below the plate's top surface. The three inconel-sheathed thermocouples should be embedded in the plate by removing cylindrical plugs from the plate.

The thermocouples should be inserted to allow the thermocouple wire to follow a horizontal path of sixteen thermocouple diameters in length, thus reducing errors due to the vertical temperature gradient in the plate. A heat conductive and electrically insulating sealant should be applied, and the steel cylindrical plugs should be replaced and welded to the plate around the top periphery of the plugs. This can be accomplished by using a 1.0 in. (25 mm) diameter miller tool, installing the thermocouples, and then refilling the hole with welded 1.0 in. (25 mm) round bar stock (see Figure D-5).

The underside curvature of the turbine is simulated with 22 gauge (0.85 mm thick) galvanized sheet metal directed upward at an angle of 45 degrees on either side of the steel plate and horizontal sheet metal extension surface. These side pieces also extend longitudinally the entire length of the enclosure, rising to a height of 4.9 ft (1.5 m) above the horizontal sheet metal and steel plate surfaces. The total width of the mockup is 6.6 ft (2.0 m). There should be a minimal gap between the

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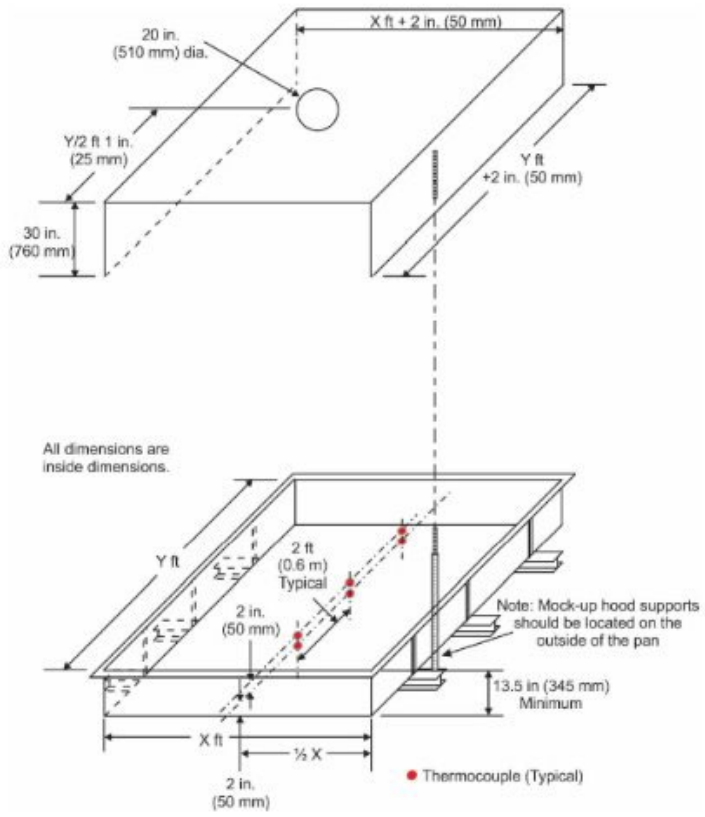
Part 16

Protection of Industrial oil cookers. This is based on the FM Test Protocol 5560, Appendix J. Fire tests for water mist systems for the protection of Industrial Oil Cookers for Open Systems.

- Scope: Industrial oil cookers.
- Requires 3 different size test set-ups,1/3, 2/3 and 1/1.
- Approval based on extinguishment within 60 sec and cooling of the oil beneath its flashpoint. Also splash of oil due to the release of the system is assessed
- Covers Industrial oil cookers up to the tested dimensions.

Protection of industrial oil cookers, Appendix J. Application of the water mist system is limited to the protection of the industrial oil cookers only, and does not include the protection of other equipment such as exhaust ducts, heaters, heat exchangers, and food processing areas, unless tested for these applications. Consideration of the application and use of nozzle protection caps to prevent or reduce the amount of nozzle contamination should be given and the use of such caps should be included in the fire test and nozzle performance test requirement programs. This local application does not include the protection of other equipment such as exhaust air ducts, heaters, heat exchangers, and food processing or food preparation areas. Consultation with FM Global Property Loss Prevention Data Sheet Numbers 4-2, *Water Mist Systems*, and 7-20, *Oil Cookers*, is required for installation of these systems.



The performance tests should be comprised of three stages, each stage using a different size industrial oil cooker mockup. At each stage, there shall be two tests; one to evaluate the fire extinguishment and cooling performance with the hood down and the other test with hood up.

Stage 1: Tests conducted with the smallest mockup of dimensions X wide by Y long, such that Y is greater than or equal to X. These dimensions shall be specified by the manufacturer.
Stage 2: Tests conducted with a mockup of dimensions X wide by 2Y long.
Stage 3: Tests conducted with a mockup of dimensions X wide by 3Y long.

The water mist system shall successfully complete both performance tests at each stage before it can be considered for an Approval for the protection of an industrial oil cooker up to the size tested. Testing may not proceed to the next stage without successful completion of the tests in the previous stage.

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Part 17

Protection of residential occupancies. This will be based on the BS 8458-1:2015.Fixed fire protection systems-Residential and Domestic water mist systems.

- Scope: Residential occupancies.
- Requires 1 test set-up with some different located fires.
- Approval based on predefined requirements such as temperature control and target nozzles.
- Covers domestic and domestic applications.

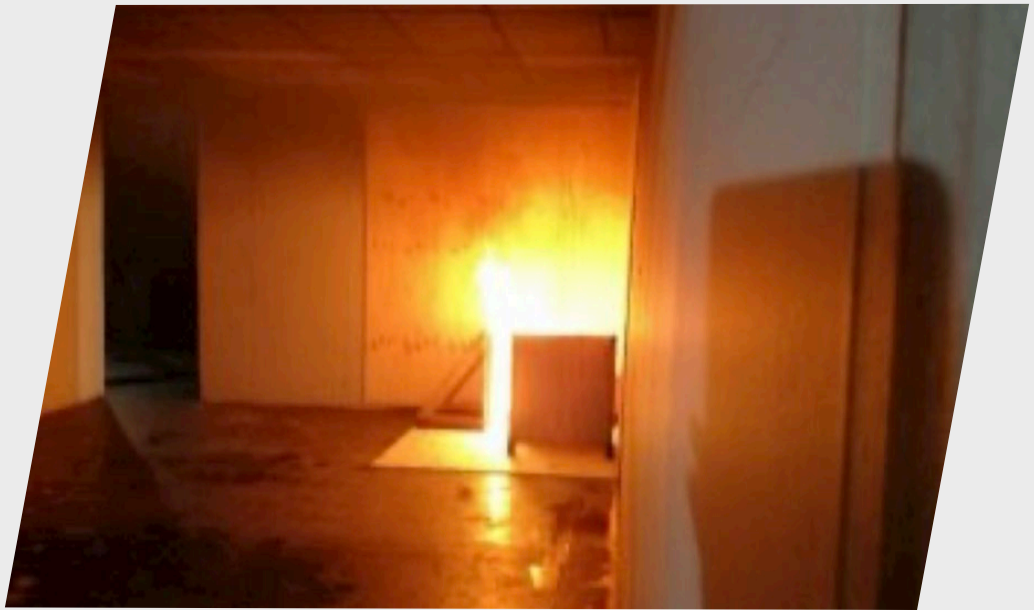
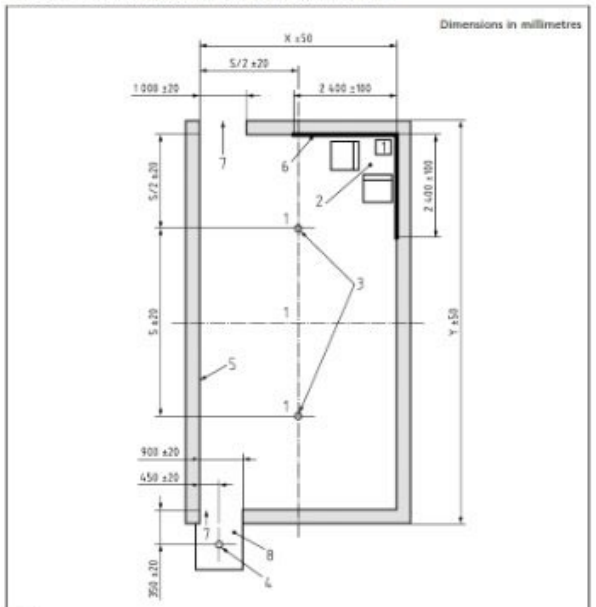


Figure C.1 Corner test layout showing a two-nozzle arrangement



Key
1 Thermocouple
2 Corner fire test ignition and fuel package (see Figure C.4)
3 Nozzle connected to water supply (see C.3)
4 Nozzle connected to water-filled pipe
5 Test room
6 Full room height plywood panels
7 Doorway
8 Porch

Scope

This British Standard gives recommendations for the design, installation, water supplies, commissioning, maintenance and testing of watermist systems with automatic nozzles installed in residential and domestic occupancies up to a maximum ceiling height of 5.5 m. It primarily covers watermist systems used for life safety, but might also provide property protection.

The recommendations of this British Standard are also applicable to any addition, extension, repair or other modification to a residential or domestic watermist system.

The British Standard does not cover watermist systems in industrial and commercial buildings. Recommendations for these systems are given in DD 8489-1 [1)].

Future CEN work

Work on implementing more well-proven test methods that creates value in the market.
Examples of such could be:

1. VdS V3883-2 OH1 sidewall nozzle test method.
2. FM5560 HC2 and HC3
3. FM5560 Local application
4. Etc.

Note: Anyone is able to suggest new test methods to CEN.

Annex A in use

Hangar protection

Challenges:

- Fire protection required due to risk of fuel spills and more.
- Hangars with high ceiling heights and large volumes.
- Obstructed fires due to the plane itself will be hard to reach from the ceiling.
- People is present, so concerns about evacuating people before the system can be released in case systems can be harmful to people.
- High value equipment so restricted damage is desirable - zoned protection

https://vidfirekill.dk/solutions/aircraft-hangars/

Annex A in use

Evaluation of the fire hazard

Fuel spills - large pool fires or small leaks of fuel directly running from an eventual leak in the wing to the floor.

This also require consideration in regards of what fuels to be used conducting the tests.

List of fire scenarios

Expensive planes, so fast activation of system in case of fire is required.

Also, considerations regarding protection of adjacent planes is part of the above-mentioned concern .

Annex A in use

Evaluation of the Compartment conditions

→

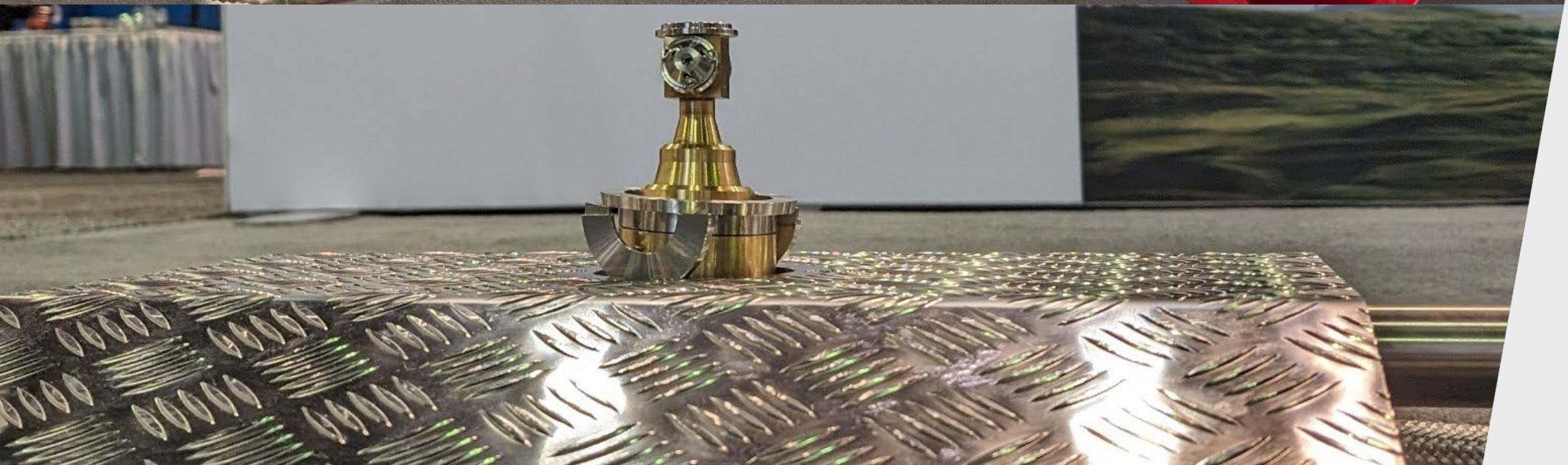
Ambient conditions
Ventilation conditions
Structure conditions
Protected volume /area

Large areas with very high ceilings, large volumes - difficult to protect with a ceiling-based system.

Hard to achieve oxygen depletion.

Can be both hot and cold environment depending on location of hangar.

Maybe ventilation issues due to open hangar doors and more.



Annex A in use

Setting up the
Fire test procedure

→

Choice of tests fire
Quantitative pass/fail criteria
Instrumentation

Discussion on how specific a set-up you need!

Pool and spray fires are well known from other test standards. So is a flowing fires resembling fuel in a steady flow leaking from the wing.

Obvious parameters could be damages to materials and temperatures.

Tests could be conducted with either Heptane or Jet fuel.

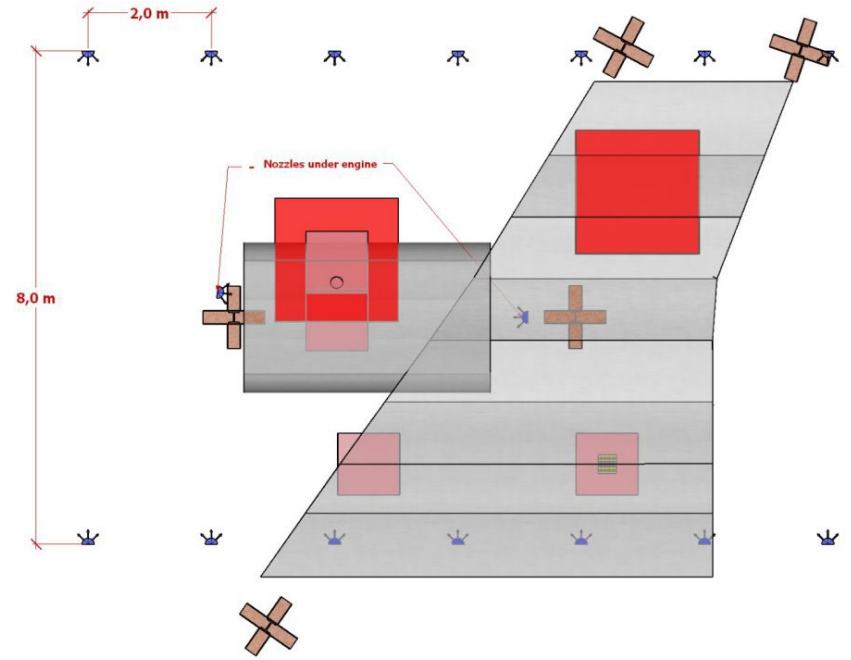


Figure 5-1 Nozzle placements

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Annex A in use

Carring out the test → Verification of compliance or non compliance with pass/fail criteria

Component tests
EN 17450 series

EN 17450

Component test series, EN 17450-1.

First component test, Published Feb. 2021.

Part 1:

Product characteristics and test methods for strainer and filter components

1 Scope

This document specifies product characteristics and test methods for strainer and filter components for water supply connections and pipe work in water mist systems. This document is applicable to strainers and filters with filtration grades up to 6 mm.

5.2.4 Body strength test

This test relates to the requirements specified in 4.5.

The inlet of the test sample shall be connected to a suitable hydraulic pressure supply and the outlet shall be blocked. The sample shall be vented and the pressure shall be increased to three times the design pressure specified by the manufacturer. This pressure shall be maintained for a period of 10 min. At the end of this period the hydraulic pressure shall be released.

A.1 Test facility

The facility carrying out the tests should demonstrate that it operates a quality management system, and that it is technically competent and able to generate technically valid results, according to EN ISO/IEC 17025.

Of particular importance with respect to testing of water mist systems are the following:

a) comprehensive understanding of water mist technology;

b) use of appropriate instrumentation and methodology to verify the compliance or non-compliance with the water mist component requirements.

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EN 17450

Component test series, EN 17450-2.
Second component test, discussions going on.

Fixed firefighting systems — Water mist systems — Part 2: Product characteristics and test methods for nozzles

Einführendes Element — Haupt-Element — Ergänzendes Element

Élément introductif — Élément central — Élément complémentaire

Test name prEN 17450-2:2022	Test name FM 5560	Test name IMO/A 800
4.3 Thermal response of automatic nozzles (RTI), 5.3	4.2.26.1 Conductivity (C-Factor)	4.14 Dynamic heating (RTI), 5.6.2
4.4 K-factor, 5.4	4.2.14 Discharge Coefficient	4.4.1 Flow and Constant, 5.10
4.6 Function of nozzles, 4.6.1/4.6.2	4.2.9 Hang-up of Operating Parts (Closed Nozzles only)	4.5.1 Function, 5.5
4.7 Strength of nozzle body and deflector, 4.7.1/4.7.2	4.2.1 Assembly load/Frame Strength (Closed Nozzles only)	4.6 Strength of body, 5.3
4.8 Strength of release element of automatic nozzles, 4.8.1/4.8.2	4.2.2 Strength of Heat Responsive Element (Closed Nozzles only)	4.7 Strength of release element, 5.9.1/5.9.2
4.9 Leak resistance, 5.9/5.6.3	4.2.3 Leakage (Closed Nozzles only)	4.8 Leak resistance and hydrostatic strength, 5.4
4.10 Resistance against aging for automatic nozzles, 5.10.1/5.6.3/5.9/5.2.2	4.2.12 High ambient Temperature Exposure (Closed Nozzles only)	4.9.2/4.9.3 Coated-uncoated nozzles, 5.7.2/5.7.3
4.11 Resistance against thermal shock for automatic nozzles, 5.11	4.2.13 Thermal Shock (glass bulb nozzles only)	4.10 Thermal shock, 5.8
4.12 Stress corrosion (brass), 5.12.1	4.2.17 Corrosion-Stress Cracking (Brass), 4.2.17.2 A / 4.2.17.2 B (B=parts SS)	4.11.1 Stress corrosion (Brass), 5.12.1/5.12.2 (SS parts)
4.12 Stress corrosion (stainless), 5.12.2	4.2.18 Corrosion - Carbon Dioxide - Sulfur Dioxide	4.11.2 Sulphur dioxide corrosion, 5.12.3
4.12.3 Salt mist corrosion, 5.12.3/5.6.3	4.2.16 Corrosion - Salt Spray	4.11.3 Salt spray corrosion, 5.12.3
4.12.4 Moist air exposure, 5.12.4/5.6.3/5.4	4.2.15 Moist Air (Any Nozzle with Moving Parts)	4.11.4 Moist air exposure, 5.12.5
4.13 Resistance against water hammer for automatic nozzles, 5.13	4.2.6 Water Hammer (Closed Nozzles)	4.13 Water Hammer, 5.15
4.14 Resistance to heat, 4.14	4.2.22 High Temperature Exposure	4.15 Resistance to heat, 5.14
4.16 Resistance to vibration, 5.16	4.2.20 Vibration	4.16 Resistance to vibration, 5.16
4.17 Resistance to impact, 5.18	4.2.21 Rough use and abuse	4.17 Impact test, 5.17

Just to add further work, UK has BS 8663-1, so the work basically is to try and get all these standards to meet.

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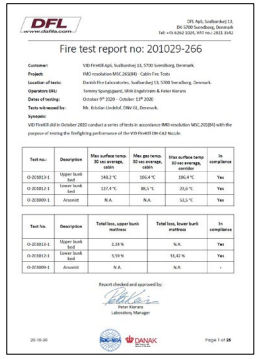
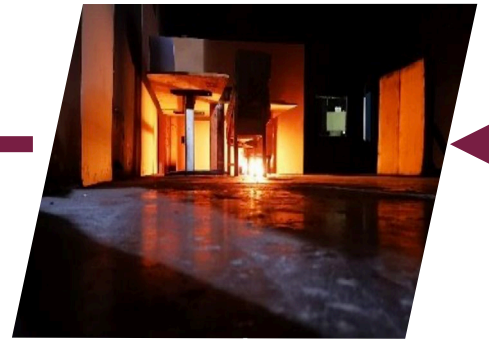
How to work with EN 14972-1:2020?

Sufficient system documentation

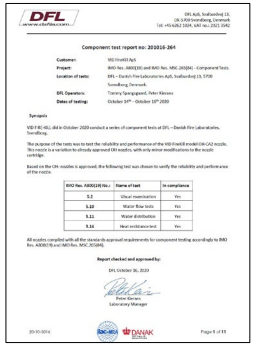
Required documentation accordingly to EN14972

- Fire test report(s) showing that the water mist nozzle(s) have successfully passed all the required tests described in a EN14972 part 2-X fire test protocol.
- Component test report(s) showing that the water mist system components have successfully passed all the required tests described in EN17450 part 1-X component test protocol (were applicable).
- Manufacturers DIOM manual made accordingly to EN14972 and including all system specific details found from the fire and comment tests as well as including other manufacturer-required information.

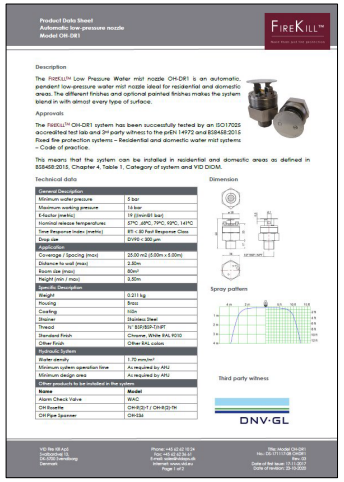




Successful fire testing conducted to a fire test method found in EN 14972 part 2-17



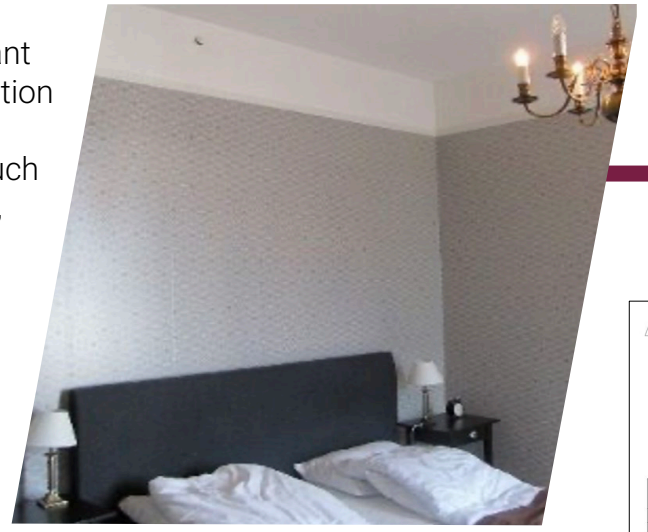
Successful component testing conducted to a component test method found in EN17450 part 1-X



Product + datasheet sent to fire and component test lab.

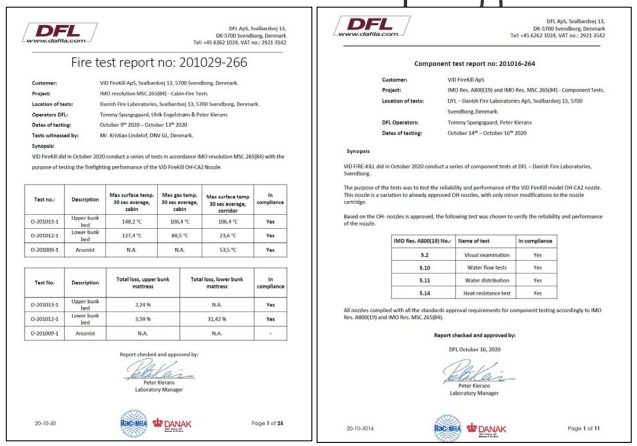
EN14972-1 in a project

Installer/Consultant define the application and applications specific details such as ceiling heights, room sizes, etc.



NO GO

GO



Fire test report no: 201029-266

Component test report no: 201016-264

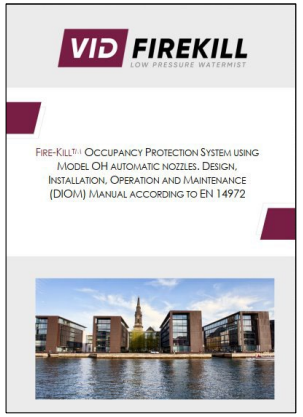
Local AHJ checks manufacturers documentation (the documents from previous slide)

+ that general requirements from EN 14972 part 1 is fulfilled

The Installer/Consultant looks into EN 14972 part 1 and verifies if there is a test method scope that match the application and the application specific details.

If yes, then the installer can find suppliers that offer the required documentation to the specific test method (EN 14972 part 2-17) and chose the one that suits them best.

All information to work with an appropriate watermist solution can be found in manufacturers DIOM manual + EN 14972 part-1



VID FIREKILL

LOW PRESSURE WATERMIST

FIRE-KILL™ OCCUPANCY PROTECTION SYSTEM USING MODEL OH AUTOMATIC NOZZLES. DESIGN, INSTALLATION, OPERATION AND MAINTENANCE (DIOM) MANUAL ACCORDING TO EN 14972

DS Dansk standard DS/EN 14972-1:2020 2021-01-06

Stationære brandslukningsanlæg – Vandtågeanlæg – Del 1: Projektering, installation, inspektion og vedligeholdelse

Fixed firefighting systems – Water mist systems – Part 1: Design, installation, inspection and maintenance

Summary

- EN 14972-1:2020 is valid, work on new annex's is progressing rapidly
- Work on 17450 Part 2 for component test of nozzles is almost finished.
- New work on Amendment 1.
- Remember the 3 important parts for products being approved according

  EN 14972-1:2020.....Fire test report, component test report and DIOM.
- Everyone can suggest a new fire test protocol to be considered getting
- into the scope of EN 14972-1:2020.....

  and very important, have a nice VID FIREKILL Seminar

Henrik Abrahamsen
R & D Manager
nh@vidfirekill.dk
+45 60388356

Thank you

www.vidfirekill.com

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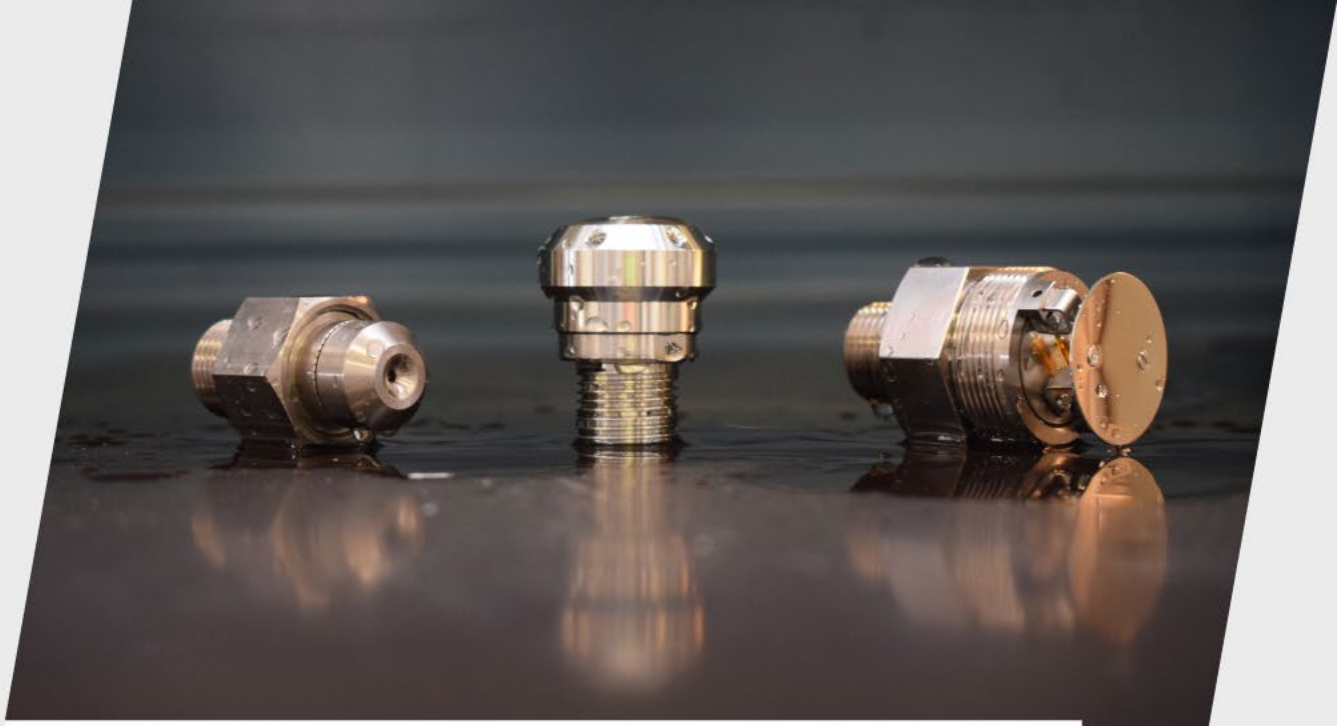
Thanks for the attention

Coffee break

15 min



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